



Finding the Interstate in Uncertainty

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TRB – Committee for a Study of the Future Interstate Highway System
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Presentation Outline

FUTURE INTERSTATE HIGHWAY SYSTEM

”Conduct a study on the actions needed to **upgrade** and **restore** the Dwight D. Eisenhower National System of Interstate and Defense Highways to its role as a premier system that meets the **growing and shifting demands** of the 21st century”

- What we know....



- What we don't know...



- Finding the path forward....





What We Know....

Interstate Condition is Struggling

Percent of travel (VMT) on Interstate Pavements with Good or Acceptable Ride Quality

Calendar Year	2000	2002	2004	2006	2008	2010
Rural Interstate						
Percent Good Ride Quality	70%	72%	74%	79%	79%	79%
Percent Acceptable	97%	97%	98%	98%	97%	91%
Urban Interstate						
Percent Good Ride Quality	44%	45%	49%	54%	56%	65%
Percent Acceptable	91%	90%	90%	93%	92%	90%

Source: Ross Crichton, Future Interstate Study Committee Meeting (Sept 2016)

Percent of Structurally Deficient or Functionally Obsolete Interstate Bridges

	2000	2002	2004	2006	2008	2010
Rural Interstate Bridges						
Structurally Deficient	4.0%	4.1%	4.3%	4.3%	4.5%	4.5%
Functionally Obsolete	13.2%	12.9%	12.8%	12.0%	11.8%	11.6%
Total Deficient	17.2%	17.0%	17.1%	16.3%	16.3%	16.1%
Urban Interstate Bridges						
Structurally Deficient	6.7%	6.5%	6.3%	6.0%	5.9%	5.4%
Functionally Obsolete	23.8%	23.0%	23.3%	23.6%	23.9%	23.0%
Total Deficient	30.5%	29.5%	29.6%	29.6%	29.8%	28.4%



Source: Brian Pallasch, Future Interstate Study Committee Meeting (Sept 2016)



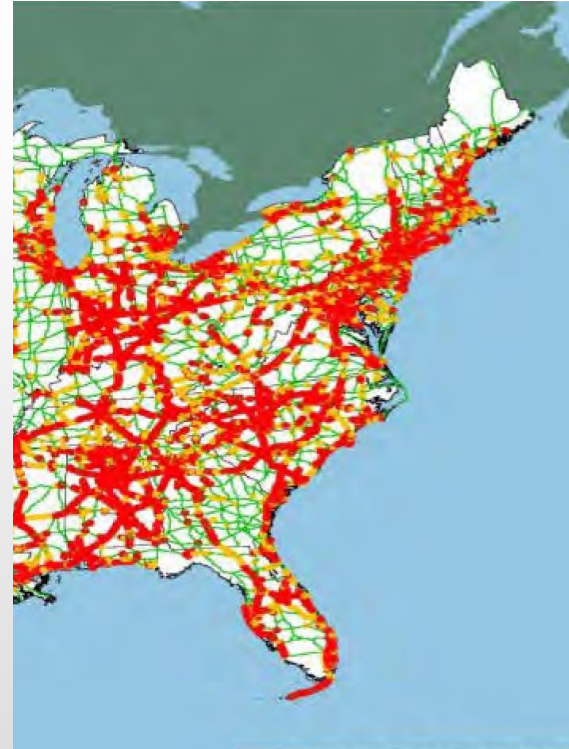


What We Know.... Demand is Growing

2007



2040

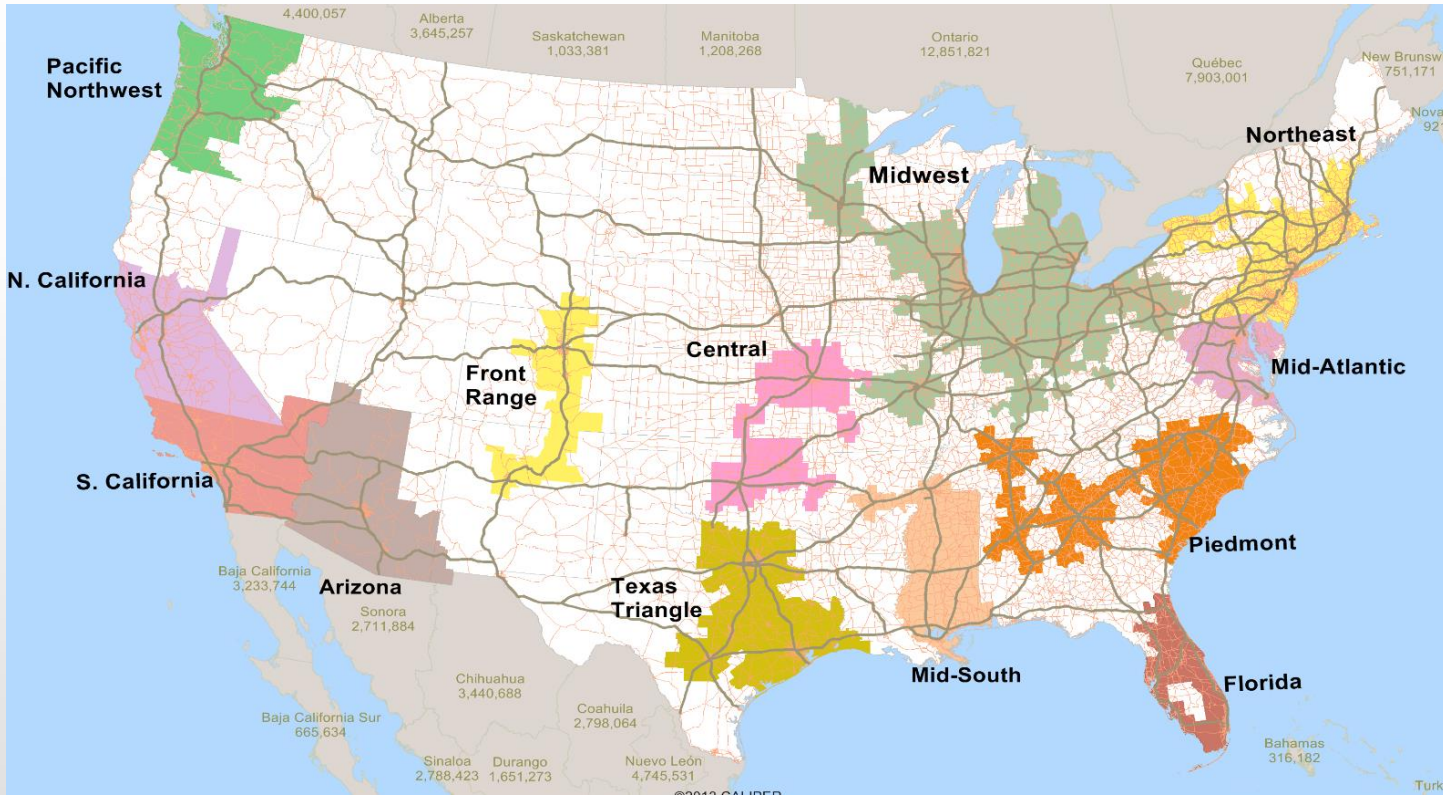


Source: Michael Trentacoste, Future Interstate Study Committee Meeting (Sept 2016)



What We Know....

People are moving to megaregions

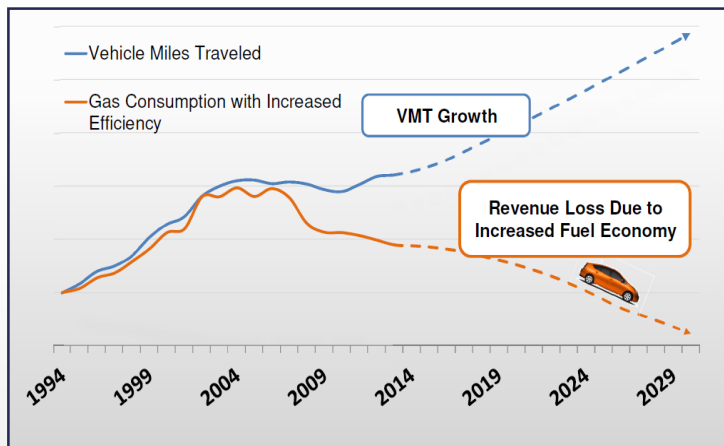


Source: James Garland (FHWA), AMPO Annual Conference (Oct 2016)

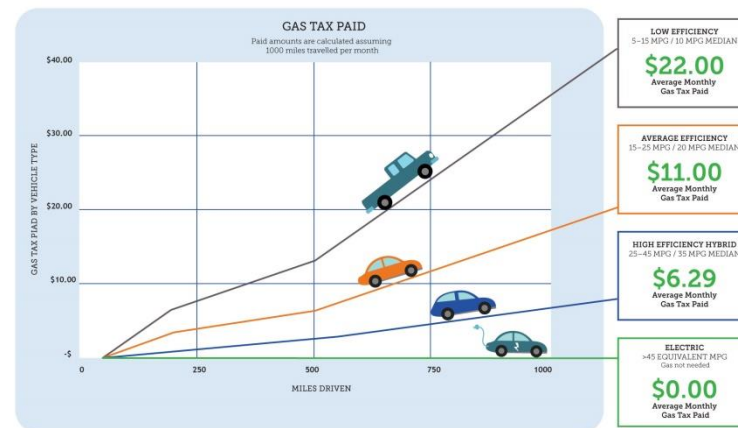


What We Know....

Transportation revenue is weakening



Source: CH2M



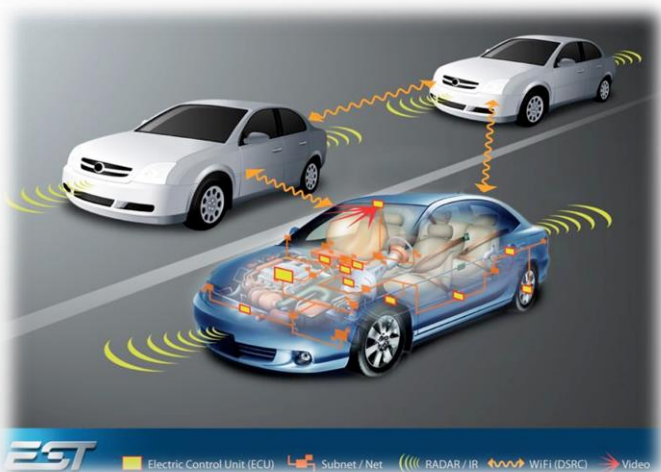
- Federal gas tax has not been raised since 1993 (and no political will to raise the gas tax)
- Inflation
- Vehicles are more fuel efficient
- Electric and hybrid cars are on the rise
- Drivers don't know how much they are paying



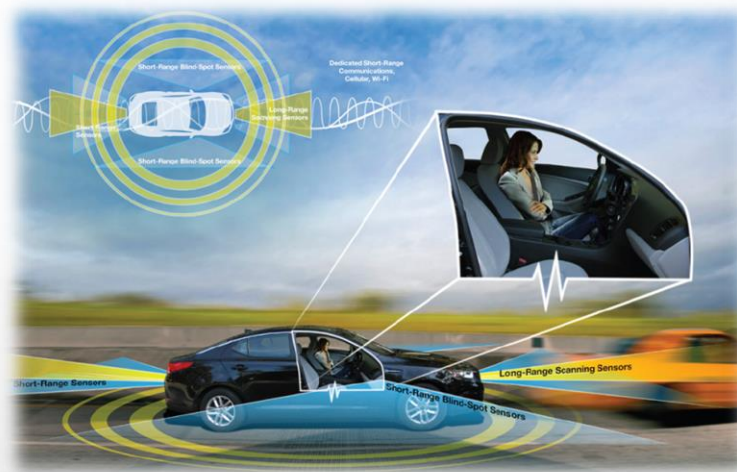
What We Know....

Automation is not a question of "if" but "when"

Connected Vehicles



Automated Driving Vehicles



Connected Travelers



Connected Infrastructure

Source: Presentation: Multimodal Intelligent Traffic Signal Systems by Dr. Larry Head, University of Arizona (June 2016)

Photo Source: <http://www.its.dot.gov>



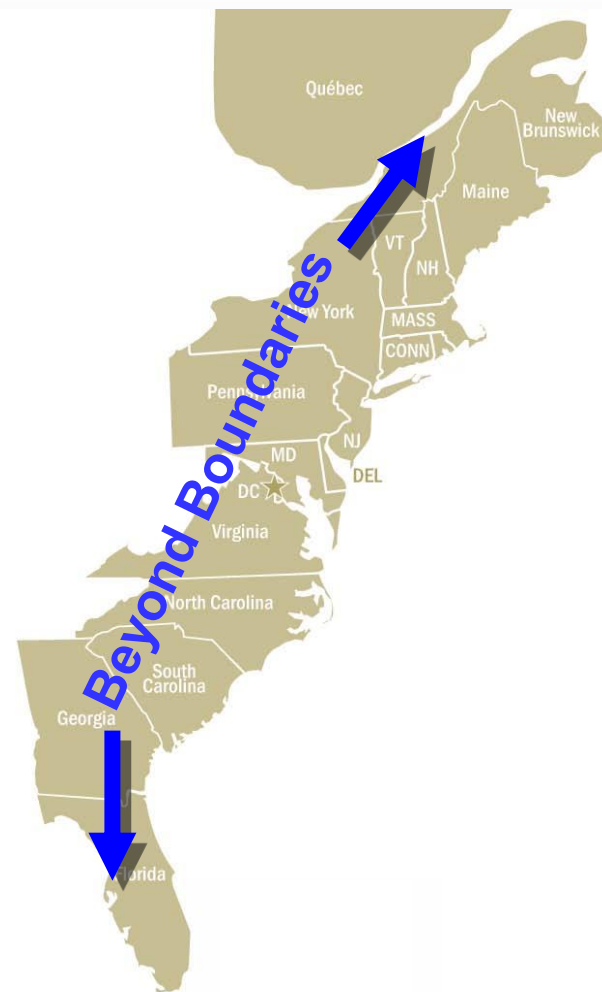
What We Know....

Transportation is the heartbeat of our economy

16 States and the District of Columbia

- \$4.7 trillion economy (40% of US GDP)
- 35% of nation's VMT (21% of road miles)
- 5.3 billion tons of freight shipments annually
- 565 million long-distance (>100 miles) trips annually
- Corridor = third largest economy in world

Note: Data from 2008





***“All I know is that I know nothing,
.....and I'm not even sure about that.”***

- Michel de Montaigne (1533-1592)



***“It ain't what you don't know that gets you into
trouble. It's what you know for sure that just ain't so.”***

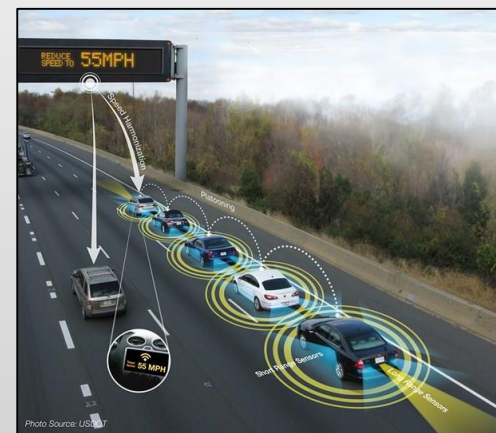
- Mark Twain (1835 – 1910)



A Rapidly Changing Environment

Just in the last few years:

- Smartphone ownership (by adults) in the US:
 - Increased from 35% in 2011 to 64% in 2015 (92% of adults now have a cell phone or smart phone)
- Tablet computer ownership (by adults) in the US:
 - Increased from 3% in 2010 to 45% in 2015
- In the Coalition region – from 2008 to 2014:
 - VMT has increased from 88.4 billion to 94.1 billion
 - Population has increased from 111 million to 118 million
- Vehicle Infrastructure Integration expanded and includes Connected and Automated Vehicles



Change Influencers



Robots that Teach
Each Other...and
Warehouse Robotics



Freight Volumes



24/7 Ports, Off-
Hour Deliveries

Tesla Autopilot



Connected and
Automated Vehicles

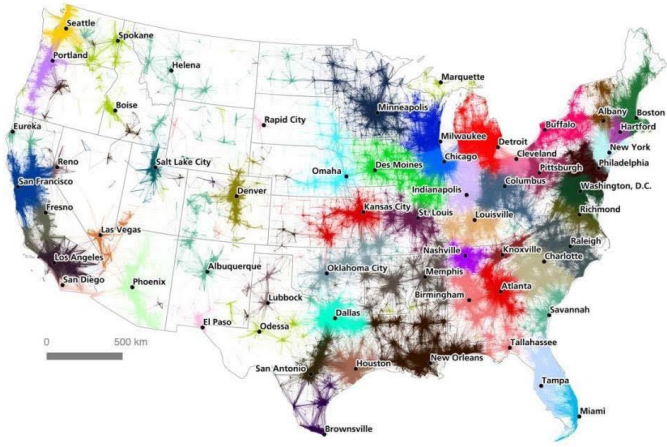


?????



What We Don't Know....

How growth will really effect transportation



Source: Besty Mason, National Geographic (November 2016)

- 50 megaregions instead of 13?
- Importance of rural areas recently demonstrated

- Urban trucking grows 800% (2015)

Source: Adie Tomer, Brookings Institute (July 2015)

- “Shifting to e-commerce actually reduced congestion” (2016)

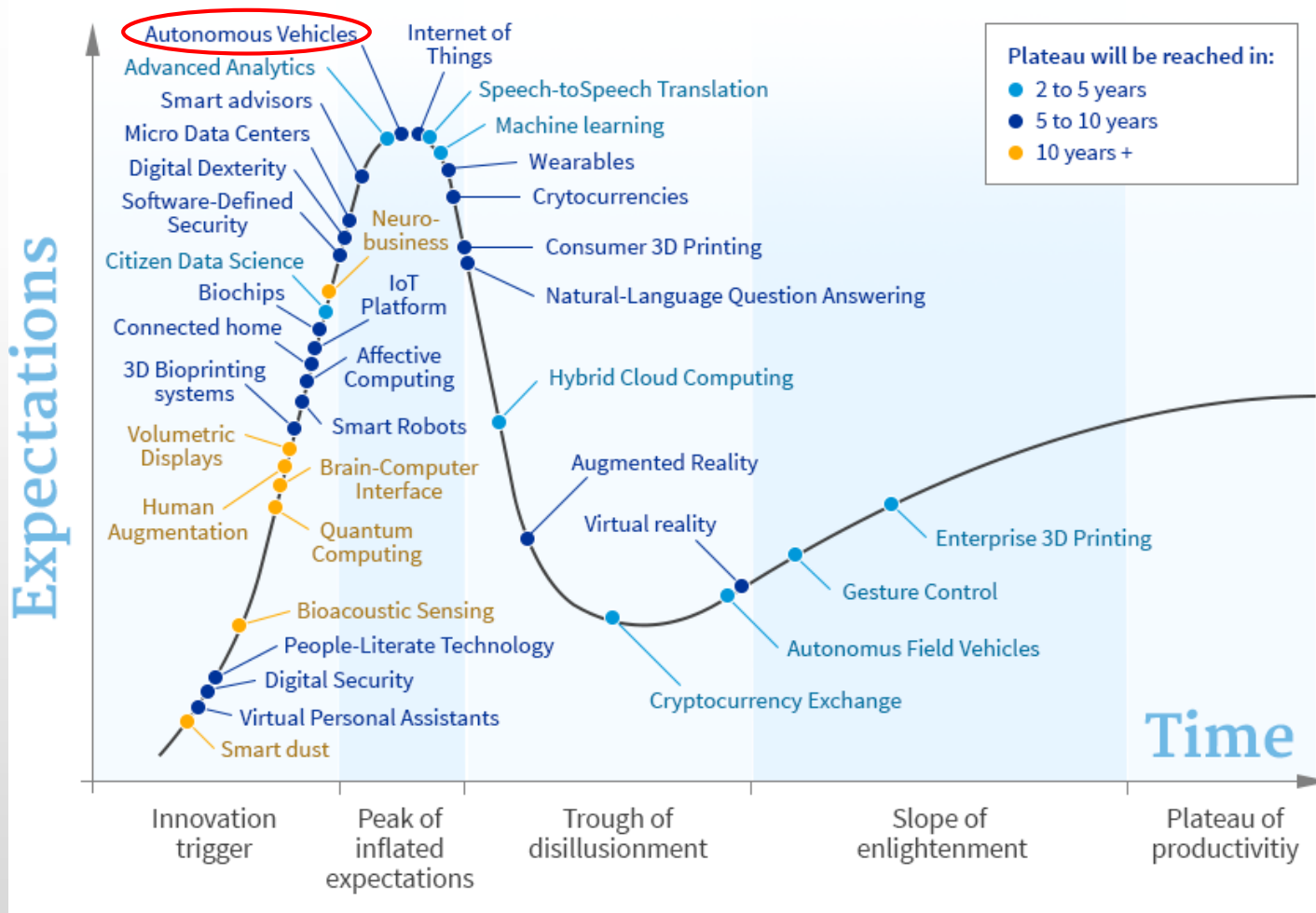
Source: Joe Cortright, City Observatory (Nov 2016)



Photo credit: Jason Lawrence, Flickr

What We Don't Know....

How to get a reality check?



Source: www.cityam.com, 08 August 2015: "Meet the Gartner Hype Cycle for 2015: It's all about self-driving cars and smart dust in emerging tech trends"



DELPHI



Owned Autonomy

- Sensors, algorithms, mechatronics



Autopia

- Autonomous PODS
- On-demand public transport

Asset Owned

x

3

4

Asset Shared

1

2

Today

- 100 yr. old model
- No computer tech

Shared Mobility

- Human driven; mobility on-demand via software



Human Driven

Autonomous

y

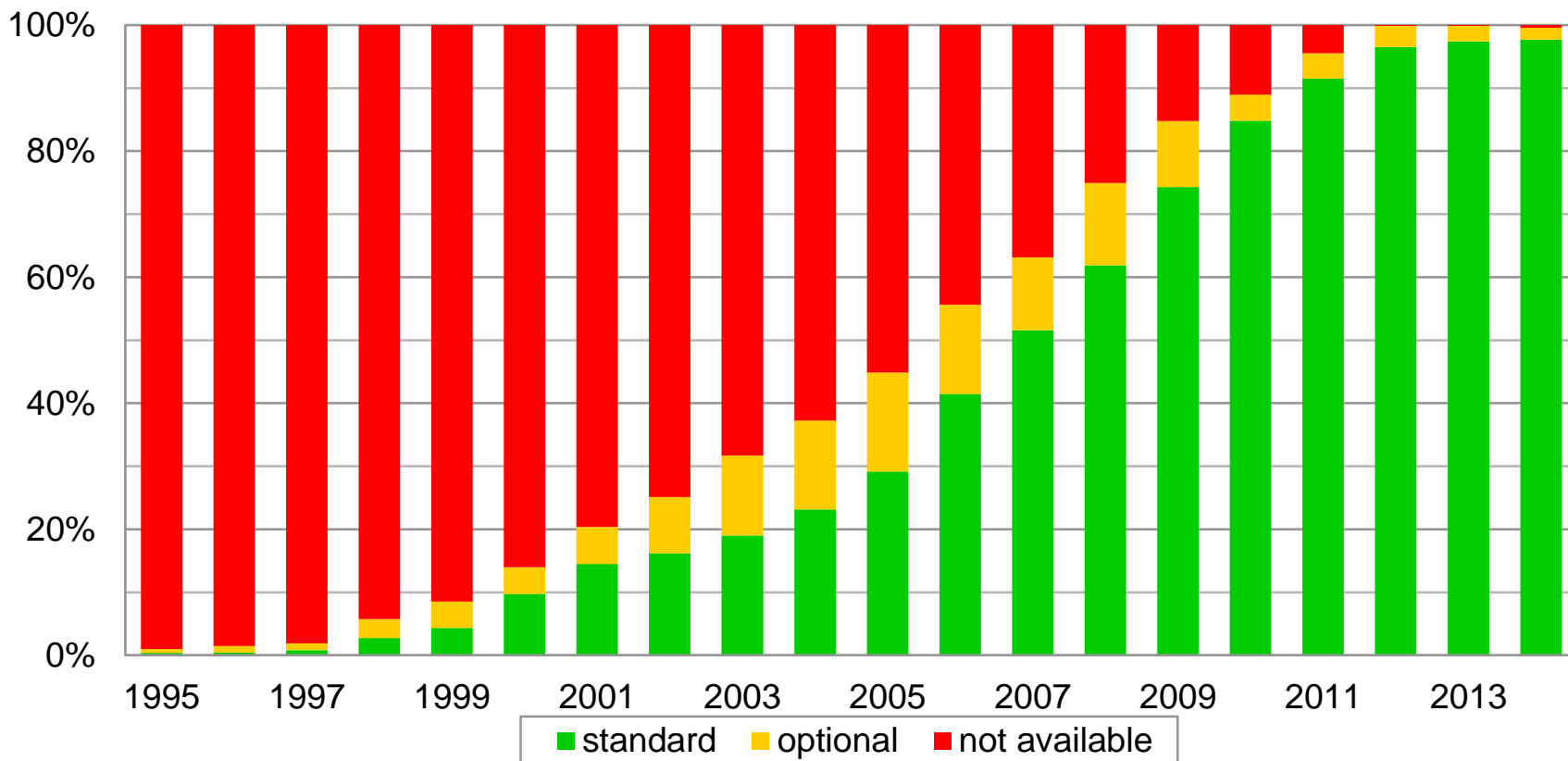


What We Don't Know....

How fast innovation will be adopted?

New vehicle series with electronic stability control

by model year



Presentation: Assessing the Effectiveness of Crash Avoidance Features- the Building Blocks for an Intelligent Transportation System (David Zuby, Insurance Institute for Highway Safety)

Source: IIHS HLDI

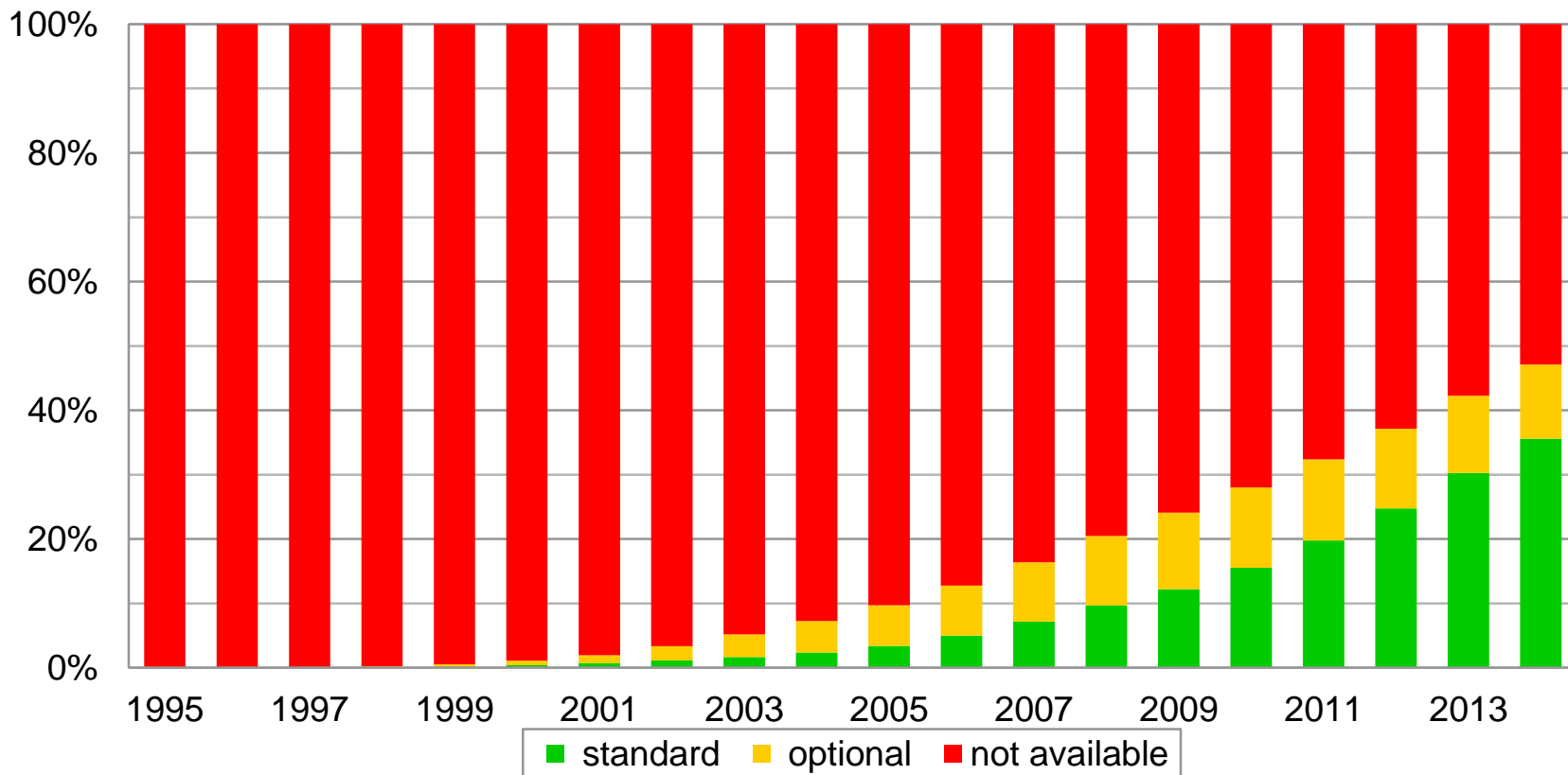


What We Don't Know....

How fast innovation will be adopted?

Registered vehicles with electronic stability control

By calendar year



Presentation: Assessing the Effectiveness of Crash Avoidance Features- the Building Blocks for an Intelligent Transportation System (David Zuby, Insurance Institute for Highway Safety)

Source:



What We Don't Know.... What will derail adoption





What We Don't Know....

Why can't we get people to pay more for transportation?

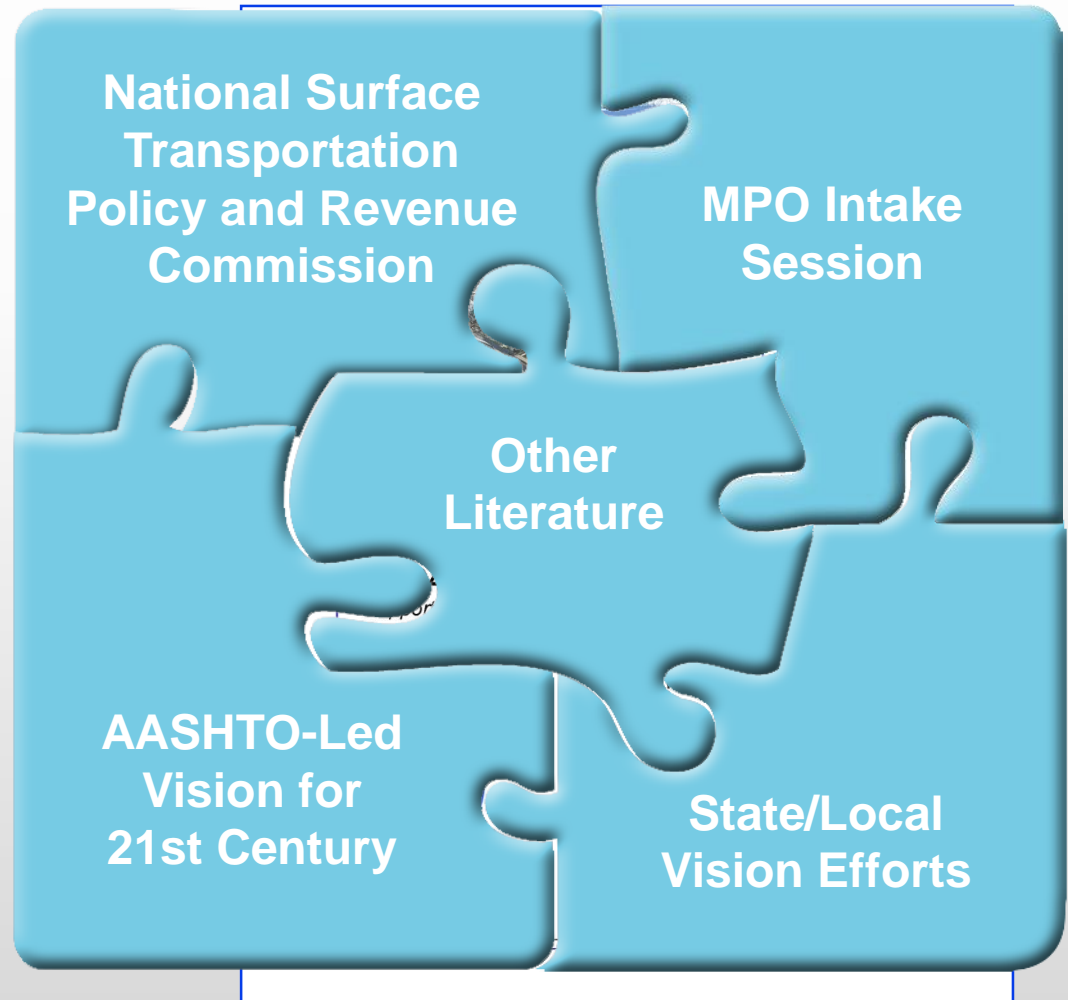


Analysis source: Rich Perrin (former MPO Director in Rochester NY)



Finding the Interstate: How Define a Vision

- The Coalition's Strategic Vision Built on Results from Nationally-Prominent and State/Regional Visioning Efforts
- Continuing a "Business as Usual" Approach to Transportation Will Lead to Dire Consequences





Finding the Interstate: How Define a Vision

Vision: Supporting Economic Growth in a Carbon-Constrained Environment



Continuing Economic Growth



Sustainable Environmental and Energy Policies



Sustainable Land Use Practices



Balanced Multimodal Transportation Systems



Finding the Interstate: How Define a Vision... with actions

Vision: Supporting Economic Growth in a Carbon-Constrained Environment



- Increased vehicle fuel efficiency
- Increased use of alternative fuels
- Reduced rate of VMT growth
- Greater use of alternative modes
- Aggressive transportation system management
 - ❖ Including pricing and connected vehicles
- Additional highway capacity
 - ❖ Especially managed lanes



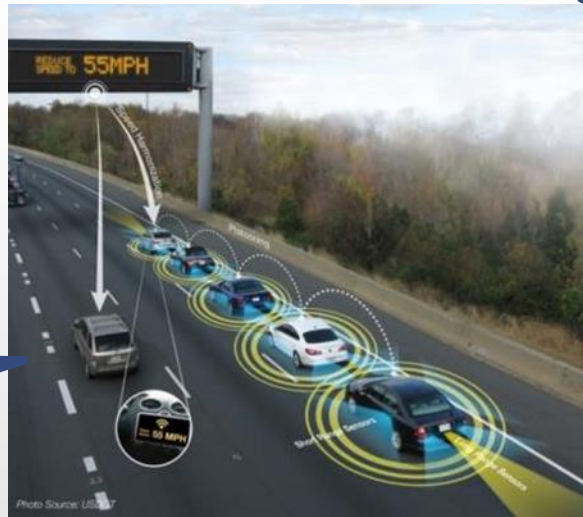
Finding the Interstate

Focus on the “why” we want the cool technology

Reduce and mitigate crashes

More mobility options

Expanded roadway capacity and enhanced traffic flow



Land use opportunities (eliminate parking)

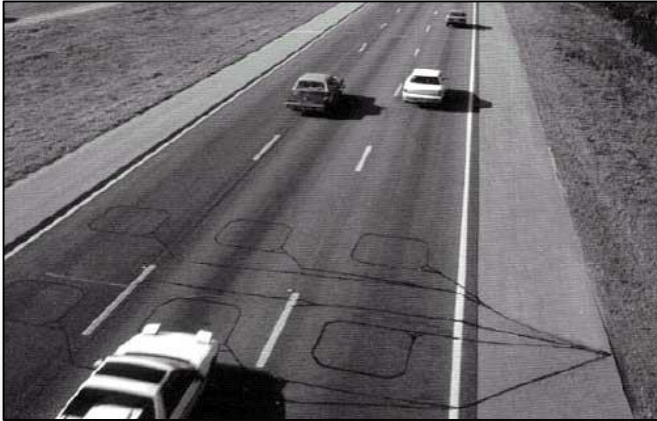
Attract business to your state

This IS happening

Fuel efficiencies and reduced emissions



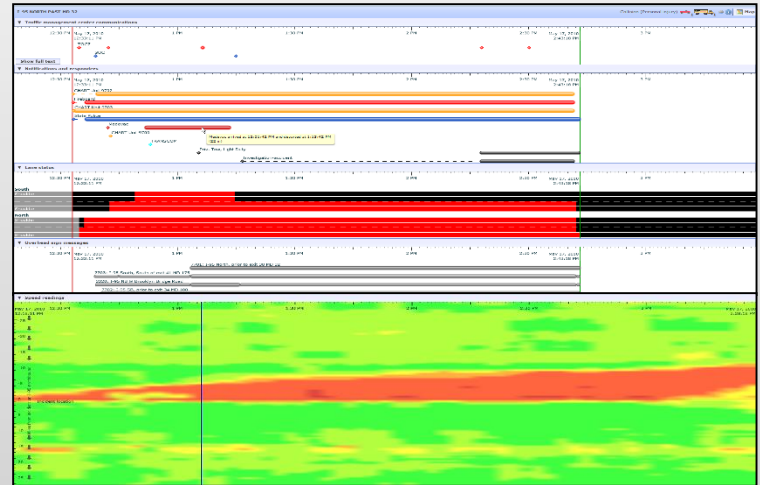
Finding the Interstate Willingness to adjust



Initial Strategic Plan:
Installation of roadway sensor
system to gather data



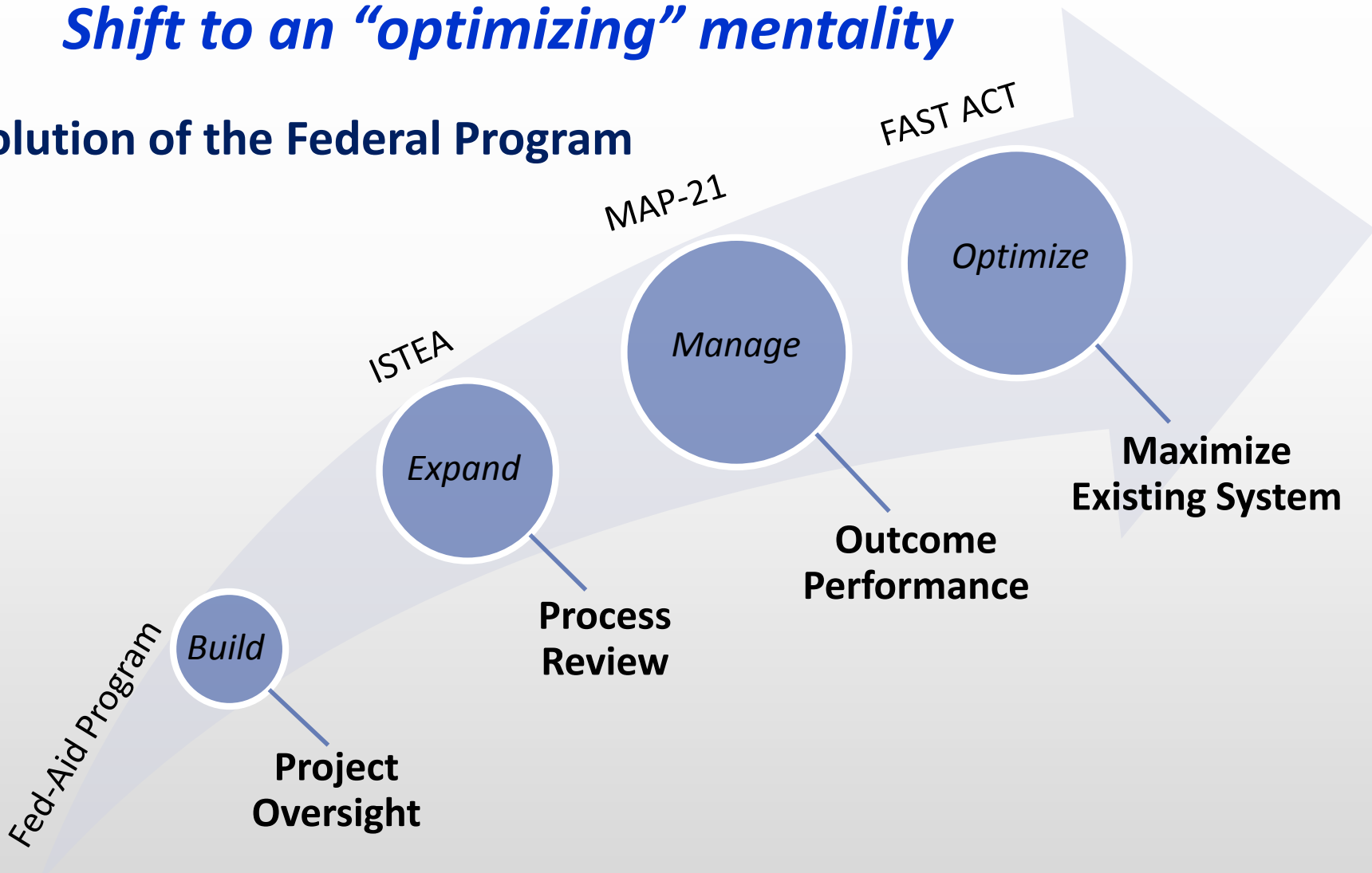
Adjustment for New Technology:
Wireless data from vehicles





Finding the Interstate *Shift to an “optimizing” mentality*

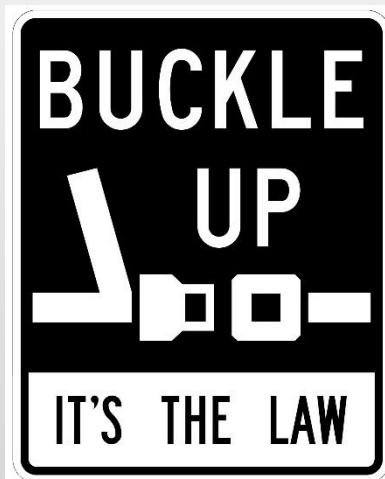
Evolution of the Federal Program



Note: Graphic is an expansion of a figure used by Jeff Paniati's opening remarks at the 2015 Transportation Systems Performance Measurement and Data Conference



Finding the Interstate: How Marketing, marketing, marketing

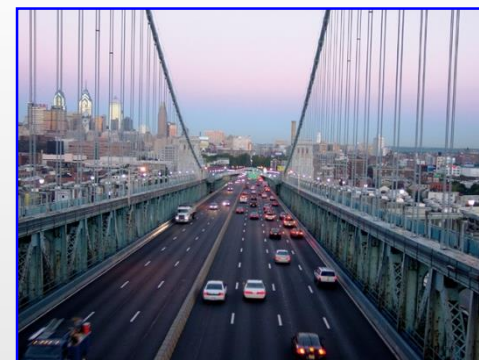
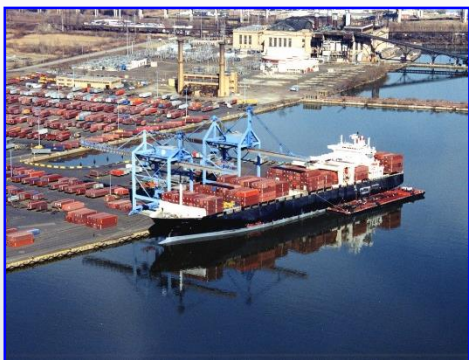




Finding the Interstate

Collaborating Across Agency Boundaries

The I-95 Corridor Coalition: Multi-Modal — Multi-Jurisdictional — Multi-Disciplinary



Formed in 1993, the I-95 Corridor Coalition is a partnership of multi-state, multi-modal public agencies working together to accelerate transportation improvements

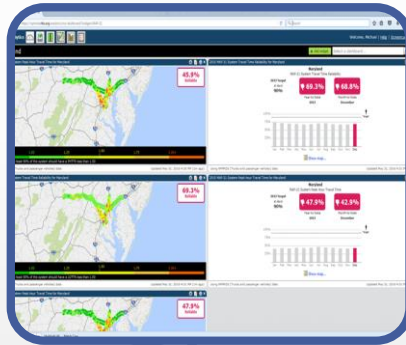




The I-95 Corridor Coalition: *Accelerating System Improvements*



Easing funding uncertainties through increased revenue – i.e., tolling interoperability and violation reciprocity



Helping agencies to adopt tools to meet performance management requirements and to improve traffic movement – i.e., vehicle probe project suite and regional integrated transportation information system



Analyzing freight flows and bottlenecks to improve supply chain performance – i.e., regional rail and freight fluidity studies



Providing a low-risk environment to explore innovation and programs – i.e., mileage-based user fee research and pilot



Key Takeaways

We do know a lot....

- ✓ Interstate condition is struggling
- ✓ Demand is growing
- ✓ People are moving to megaregions
- ✓ Transportation revenue is weakening
- ✓ Automation is not a question of “if” but “when”
- ✓ Transportation is the heartbeat of our economy

But we face many uncertainties.....

- Rapidly changing environment with multiple “influencers”
- How will growth really effect transportation?
- How to get a reality check?
- What path will technology adoption follow?
- How fast will innovation be adopted? What will derail adoption?
- Why can’t we get people to pay more for transportation?

Finding the Interstate

- Define a vision
- Focus on “why” we want the cool technology
- Adopt a willingness to adjust
- Shift to an “optimizing” mentality
- Marketing, marketing, marketing
- Collaborating across agency boundaries





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***“Make no little plans;
they have no magic to
stir men’s blood.”***

Daniel Burnham, 1893

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